

X.—Description of a new Species of Sessile-eyed Crustacean, and other Notices. By the Rev. THOMAS R. R. STEBBING, M.A.

[Plates IV. & V.]

Microdeuteropus bidentatus, n. sp. Pl. IV. figs. 1, 1 a, 1 b.

This new species of *Microdeuteropus* was dredged at Salcombe in August of the present year (1875). It exhibits well the characters of the genus as given by Messrs. Bate and Westwood, if we except the expression "complexly subchelate," which they apply to the first gnathopods. This complexity, however, does not belong to all the species they describe, nor to the females of any of them. The genus *Autonoë* of Bruzelius was separated from *Microdeuteropus* of Costa to receive species which do not possess the complexity in either sex, and which have the rami of the last pair of pleopoda unequal. But the separation seems scarcely desirable, since there appears to be no correlation between the two characters used for the generic distinction. Thus the present species and *M. longipes*, at least as described in the 'Catalogue of Amphipodous Crustacea,' have the rami of the last pleopoda equal, but the hands not complexly chelate. On the other hand, *M. grandimanus*, also described in the Catalogue just mentioned, has the rami of the pleopoda unequal, but the posterior angle of the carpus of the first gnathopods produced into a tooth in the male—a circumstance which links it closely to the *M. gryllotalpa* of Bate and Westwood, *M. anomalus* of Rathke.

In general appearance the new species has a near resemblance to *M. Websteri*. The superior antennæ have a secondary appendage of three slender articulations, and a flagellum of fifteen. In the lower antennæ the articulations of the flagellum are comparatively stout, but only four in number. The eyes are small and black. The whole animal is slender, and, like others of the genus, when dead has a metallic lustre. The telson has a double apex, carrying two short spines and two setæ. The last pair of legs exceeds in length the preceding pair by the whole of the long thin propodos and finger; the antepenultimate pair is the shortest; the third and fourth pairs are equal in size, having the finger two thirds the length of the propodos. The thighs of all the seven pairs of legs are long; those of the second gnathopods are distinguished by a sort of curved spur projecting at the anterior distal angle; in other respects this pair of gnathopods

seems scarcely distinguishable from the corresponding limbs of *M. Websteri*: the general proportions are the same; and the wrist and hand are in like manner densely clothed with long hairs on the anterior margin, while tufts project from the other side. Close to the extremity of the palm is a slender spine, which the finger, when in a clasping position, overlaps. The first gnathopods exceed the second in size, but to no very great extent; they agree with the second in hirsute adornment, with, however, this addition, that the hinder part of the metacarpus is here clothed like the front of the wrist and hand. The wrist is rather longer than the hand, but scarcely so wide. The palm of the hand is quite unlike that of any of the other hitherto described species of *Microdeuteropus*: the defining angle is rounded off; from the interior of this curve rises a transparent spine, itself slightly curving, against the outer side of which the serrated finger impinges when clasped. Almost parallel with the spine a strong tooth shoots up from the palm, meeting the concavity of the finger, and beyond this another, smaller tooth, nearer to the wavy line which marks the hinge. The spine is capable of an independent motion backwards and forwards in the line of the finger. Under the microscope little circles or dark points in orderly arrangement mark the places of insertion of the long bright hairs, producing a very agreeable effect.

It is right to notice the remarkably close resemblance of this species to the *Microdeuteropus (Gammarus) longipes* of Lilljeborg, taken at Kullaberg in Scania. But whereas in our species the first gnathopods have the two processes on the palm of the hand, in the foreign species they are stated to be on the posterior margin. The words of Lilljeborg's description are "Manus pedum thoracicorum primi paris iisdem secundi paris majores, apud marem ovatae, ad marginem posticum, unguem propius, processibus duobus et aculeo interno mobili praeditae," which Mr. Spence Bate, in the British-Museum Catalogue, thus translates:—"First pair of gnathopoda larger than the second, having the propodos in the male ovate, furnished on the posterior margin near the dactylos with two processes and an internal movable spine."

Boeck's description of the species says, "Pedes primi paris apud marem articulo primo postice perdilatato et setoso; carpo permagno sed brevior quam manu; hac ovata, in margine inferiore dentibus validis duobus armata." It may be remarked that the first joint of these gnathopods in the Salcombe species, though broad, is not very remarkably so, and is certainly not setose; nor is the finger in the third and fourth pairs of legs

equal in length to the hand, as in Boeck's account. The Rev. A. M. Norman, to whose kindness I am indebted for the means of comparing the foreign literature on the subject of *Microdeuteropus* (*Autonoë*) *longipes*, doubts whether Boeck is really describing the same species as that which Bruzelius names *Autonoë longipes*; for, while the branches of the last pleopoda are said by Lilljeborg to be equal to one another, and by Bruzelius to be twice as long as their stem, Boeck speaks of the outer branch alone as being much longer than its peduncle. On the other hand, the *Gammarus longipes* of Lilljeborg suits the Salcombe species in all respects, if the term "margo posticus" could be understood to mean not what is commonly called the hinder margin, but the palm at right angles to it. In that case the name *bidentatus* would have to succumb to the priority of *longipes*.

It may be added that Boeck is not very consistent in his discrimination of *Microdeuteropus* from *Autonoë*. In the generic character of the former he says that the last pleopoda have the inner and outer branches almost equal in length. He then gives two species:—*M. gryllotalpa* (*grandimanus*, Bate), in which the outer is a little longer than the inner branch; and *M. anomalus*, in which, he says, the branches are equal. In the generic character of *Autonoë* he tells us that the outer branch is longer than the inner. This, it must be presumed, implies a decided inequality; otherwise it would be no mark of distinction from the genus *Microdeuteropus*. Yet of the only two species described, *A. longipes* and *A. plumosa*, it is doubtful whether the former possesses this character; and of the latter Boeck himself says, not that one of the branches is, but that the branches are, twice as long as their peduncle. So that, if things which are double of the same are equal to one another, this species ought not to be reckoned an *Autonoë*, or the generic character of *Autonoë* must itself be amended, which would be best effected by its reabsorption into *Microdeuteropus*.

Anonyx obesus, Spence Bate = *Acidostoma obesum*,
Lilljeborg.

An example of this species, not hitherto recorded from the south, was taken at Salcombe on the muddy sand, from which *Ophiura brachiata* may be dug at very low tide. The specimen was salmon-coloured with white markings, the legs and antennæ white, the eyes orange-red.

Kröyera arenaria, Spence Bate. Pl. IV. fig. 3.

The genus *Kröyera* was separated from *Monoculodes* of Stimpson only on the ground that the animals belonging to it have the eyes apart and the second pair of gnathopoda chelate. It so happened that, while the 'British Sessile-eyed Crustacea' was passing through the press, the authors became acquainted with a new species on all accounts demanding admittance into the genus, except from its having the eyes confluent. The separateness of the eyes can no longer, therefore, be reckoned among the characters of the genus; and the genus itself might well be cancelled, and the species assigned to *Monoculodes*. As far as the confluence of the eyes is concerned, it is not only *Kröyera altamarina* that possesses this Cyclops-like appearance; it belongs also to the species *Kröyera arenaria*, on which the genus was founded. At least, if specimens taken in South Devon may be trusted, the eyes, which are situated on the projection of the head, meet in the centre, being distinct, indeed, from one another, but closely united; they are magenta in colour, prettily picked out by white facets. The boundaries are determined by two concentric curves across the head, and at the sides by the shape of the projection of the head, the lines of which they follow. The white median line which divides and unites the two organs pursues a straight course.

It will often be in vain to seek for the eyes in specimens that have been long dead; the pigment invariably loses its colour, and generally becomes dispersed or invisible. As the specimens described by Messrs. Bate and Westwood appear to have reached them from a distance, it is probable that the eyes were not in a condition to admit of accurate description.

Lilljeborgia Normanni. Pl. IV. fig. 4.

This species was described in the 'Annals' for July 1874, from specimens taken at Salcombe. In those specimens the last pair of pleopoda were wanting; and as the closely allied species *Lilljeborgia shetlandica* (B. & W.) was described by Messrs. Bate and Westwood from specimens in a similar predicament, the present opportunity is taken of giving an account of these organs as seen in the female of *Lilljeborgia Normanni*. There is not likely to be much difference between the two species in this respect. The stem of the pleopoda in question is stout, widening towards the distal end, and projecting as far as the

branches of the other pleopoda; its two branches are equal in length, broad and thin, the upper one being as it were sheathed in the lower. The spines are set rather away from the edges. On the distal end of the stem three spines make themselves conspicuous, a long one followed by two short ones. The telson is in two pieces, which can move independently; the lower part is curved; the upper ends in a long point, preceded by a cavity and another sharp tooth; from this cavity spring two spines, a long one and a short one.

Melita gladiosa, Spence Bate. Pl. IV. figs. 2, 2 a-d.

This species is tolerably common in the estuary at Salcombe; but only the male has as yet been described. The female agrees in form with the male very minutely, except in regard to the second pair of gnathopods. These in the male present a short wrist, but a large and broad hand with a curiously serrated and uneven palm and a massive scimitar-like finger, all much exceeding in size the corresponding parts of the first gnathopods. In the female the two pairs are nearly equal: both pairs in this sex have the finger pointed and simply curved, the palm nearly straight and set with a row of short fine hairs. The first pair have a dense fringe of fine short hairs also on the hinder margins of the metacarpus, wrist, and hand, such as occurs in the female of *Melita obtusata*. In the first pair the wrist and hand are equal and similar, both being broadly oval; the palm of the hand is scarcely defined. In the second pair the palm is defined by a small tooth, the wrist is about as long as that in the first pair, but not so broad; the hand is equal in breadth to that of the first pair, and about one third longer.

Both in the male and female the third segment of the tail has the lower half of the hinder margin and the hinder half of the lower margin serrated, just as in *Megamœra Othonis* of Spence Bate, which the Rev. A. M. Norman has ascertained to be the female of *Mœra longimana*.

A striking characteristic of *Melita gladiosa* in both sexes is the dentation of the pleon. According to Bate and Westwood, all the segments of the pleon, except the sixth, have the dorsal surface of the posterior margin furnished with three teeth. The exception is unnecessary; for in fact the three teeth are present, though much less pronounced and rather difficult to observe, in the sixth segment. The telson is double, each branch having a spine rising from the centre, and the upper

margin concave between this spine and the pointed extremity. In the last pair of pleopoda the minute upper branch is broadest near the distal end.

A specimen of the male dredged at Salcombe has one of the second gnathopods normal, the other much smaller and almost without trace of denticulation. A specimen of *Melita palmata* taken at Torquay presents a similar inequality in the second pair of gnathopods. Another example of *M. palmata* in the same condition has been described by Mr. Spence Bate; who suggests in explanation that a limb has been lost by some injury, and then replaced by a new one imperfectly developed. These casualties would seem to argue a combative disposition in the genus *Melita*.

Proto Goodsiri, Spence Bate.

As in the 'British Sessile-eyed Crustacea' *Proto Goodsiri* is thought to be only a northern species, it may be worth while to record its capture in the Salcombe estuary during August of this year (1875). The work just mentioned affirms that "the tail is very rudimentary, and supports in the male a single pair of rudimentary propoda." In the Salcombe specimens, however, there are two pairs of these styliform appendages, as in the closely allied species *Proto pedata*. Both species were dredged in the same part of the estuary; and the female forms, found in proximity to each among the contents of the dredge, were not distinguishable from one another.

The numerous variations in the second gnathopods of *Caprella acanthifera* make the suggestion at least plausible that *Proto pedata* and *P. Goodsiri*, mainly distinguished as they are by differences in the hands of the second pair, may be only varieties of one and the same species, with *P. Goodsiri* for the older, as it seems to be invariably the larger, form.

Tanais vittatus, Lilljeborg.

In discussing the genus *Apseudes*, Messrs. Bate and Westwood take occasion to remark that, although they had examined some hundreds of individuals of the genus *Tanais*, they had never seen one possessing the features of a female. At the same time they call attention to Rathke's figure of his *Crossurus vittatus*, with a large incubatory pouch filled with large eggs, this *Crossurus* being the *Tanais* of Lilljeborg. They mention also that Müller, Rathke, and Lilljeborg have described the females of *Tanais* as resembling the males. Additional

evidence can scarcely be needed; but it will do no harm to place on record the capture of a fine specimen of *Tanais vittatus* with eggs as described by Rathke. It was taken in August 1875 from the shore-piles on the North Sands at Salcombe, in which, as in similar piles at Torquay, this species abounds along with *Chelura terebrans* and *Limnoria lignorum*.

Apseudes Latreillii, Bate and Westwood.

This species, hitherto recorded only from the North, was dredged this summer at Salcombe. The antennæ bear a very close resemblance to those of *Apseudes talpa*, a fact which could scarcely be guessed from the figures of the two species in the 'British Sessile-eyed Crustacea.' There is, however, apparently no crenulation in the large basal joint of the upper antennæ, though it has the uneven outline and setæ noticeable in the other species.

Jæra albifrons, Leach. Pl. V. figs. 5, 5 a, 5 b, 6, 6 a, 7.

The generic character of *Jæra* in the 'British Sessile-eyed Crustacea' states that "the pleopoda or branchial appendages" are "covered by a large plate occupying the entire under surface of the pleon." In the remarks which follow, however, it is explained that this plate (or "grande lame operculaire," as Milne-Edwards has called it) is a sexual distinction peculiar to the females. It is necessary to bear this in mind in order to infer, what is not otherwise indicated, that the *Jæra albifrons* figured and described in the work referred to is a female form, while the *Jæra Nordmanni* of the same work is a male. One might easily jump to the conclusion that they were the sexes of a single species; nevertheless such a leap in the dark would land us in a mistake. On all the shores near Torquay *Jæra albifrons* is very common, and, at least in one spot (on Meadfoot Beach), *Jæra Nordmanni* is, or till lately was, also abundant. But though in close propinquity, the two species were not mixed, *Jæra Nordmanni* occupying a higher zone of the beach than its congener. Messrs. Bate and Westwood give the same length for each of the species, namely "about one sixth of an inch." This is probably an oversight or a printer's error, since, though the figure of *J. Nordmanni* happens to be a larger one than that of *J. albifrons*, in the lines which indicate the natural sizes these dimensions are reversed. As a matter of fact no members of the Meadfoot colony of *J. Nordmanni* appeared to attain fully even an eighth of an inch

in length, while adult females of *J. albifrons*, though specimens vary considerably, are often fully one sixth of an inch. But along with these fine and prolific specimens may be found many smaller, which have no doubt often been neglected as juveniles, as equally without doubt some of them are. A fair proportion, however, will be found to differ in construction from the females; and from the absence of the opercular plate and constant occurrence along with the females of *J. albifrons*, they may be taken with considerable certainty to be the males of that species.

They are not dilated, like the female, at the third segment, but have the body parallel-sided. The curvature of the pleon is laterally a little compressed, or in some specimens even slightly incurved; the apparatus of the underside of the pleon is divided down the centre. The plates meet but do not overlap; reaching nearly to the notch of the caudal margin, they form a flattened arch over it, ending on either side in a sharp produced point. There is no horizontal division of these plates as in *Jæra Nordmanni*; but a quasi-oval scale of the branchiæ is visible on each side. The lateral margins of this apparatus are fringed with very minute hairs, and have a sinuous outline curving outwards near the base and then inwards. The carpus of the leg has a considerable swelling at its distal end, surmounted by two short hairs or spines. This protuberance is not found in the female. Both sexes in both species have the margins of body and pleon set with hairs, not all of one length but alternately (or nearly so) long and short. *Jæra Nordmanni* is rather more setose than the other species.

EXPLANATION OF PLATES IV. & V.

- Fig. 1.* *Microdeuteropus bidentatus*; 1 *a*, first gnathopod; 1 *b*, second gnathopod.
Fig. 2. *Melita gladiosa* (female); 2 *a*, maxillipede; 2 *b*, first gnathopod; 2 *c*, second gnathopod; 2 *d*, pleon.
Fig. 3. Eyes of *Krøyeria arenaria*, seen from above.
Fig. 4. Pleon of *Lilljeborgia Normanni*.
Fig. 5. *Jæra albifrons* (male); 5 *a*, leg; 5 *b*, underside of pleon.
Fig. 6. Underside of pleon of *Jæra albifrons* (female); 6 *a*, leg.
Fig. 7. Underside of pleon of *Jæra Nordmanni*.